

Box-Joint Jig

Router template indexes cuts

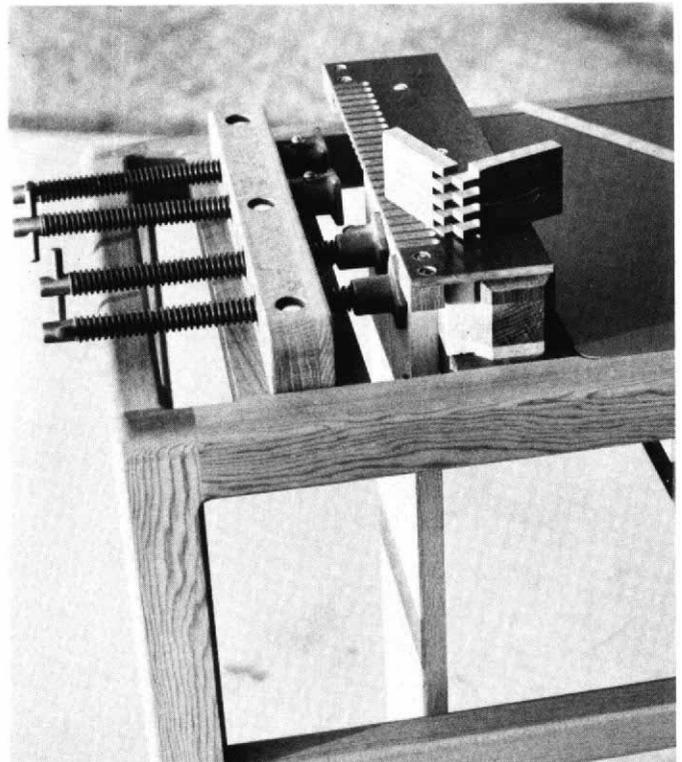
by Patrick Warner

The box joint is being used less and less today and it's no wonder, considering the setup complications, the danger of holding workpieces vertically on table saws, the indexing hangups and the assembly problems. After studying most of the classical box-joint cutting methods and tools, I decided to design and build a template jig that could be used with a router. (For the table-saw method of making this joint, see *Fine Woodworking*, Winter '76, page 34.)

I've made dozens of boxes and drawers and have found that most don't measure more than 12 in. high and 36 in. on a side. Most stock used for small boxes is $\frac{3}{8}$ in. to $\frac{3}{4}$ in. thick. I made my jig to accommodate these dimensions with no changes in setup.

In designing the jig, I aimed for simplicity of operation, safety, rapid setup and indexing, accuracy, precision, repeatability, and latitude in box sizes. I built it into a table that's split to allow the stock to be held vertically—the jig is on one side of the split, the press screws are on the other (see photo below). The table is both portable and stable, and has a utility drawer, my first box made with the jig.

The template, the heart of the jig, is made out of laminated phenolic—it's smooth, slippery and strong. The stock should be no more than $\frac{1}{4}$ in. thick, to use up as little of the vertical travel of the router as possible. I had mine milled at a local machine shop, although I first squared up the stock on a



jointer and carbide saw. The slots, $1\frac{1}{8}$ in. deep, were milled with a $\frac{5}{16}$ -in. end mill, leaving pins $\frac{3}{16}$ in. wide on $\frac{1}{2}$ -in. centers. A milling machine will easily hold $\pm .001$, and I suspect $\pm .0025$ is tolerable. Job shop time should not exceed 30 minutes, if the stock is presquared.

The template overhangs a pillow block, which is tenoned to an oak cross-member. Stops on either end of the template index the workpiece. When indexed on one end the yield is a pin; the other end yields a socket. The workpiece is clamped vertically against a piece of scab stock, and each side of the box is cut separately. The router with its $\frac{5}{16}$ -in. outside-diameter template guide and $\frac{1}{4}$ -in. bit traverses the tines of the template, as in dovetail-cutting jigs.

The scab stock backup board is especially important because without it the router bit will tear out the back side of the panel. One scab board will usually accommodate the four corners of one box because it can be used turned upside-down

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and backwards. The scab board is located to guarantee the entry of at least half of the diameter of the bit, and is held snug against the template with standard spring plungers (available for about \$2 each from Vlier Engineering Corp., 2333 Valley St., Burbank, Calif. 91505).

If the template has been cut well but the first joint doesn't fit, the outside diameter of the template guide can be turned down. As a final measure, the router bit can be ground to correct the error in the fit. The router bit should be a $\frac{1}{4}$ -in. carbide two-fluted straight-faced bit that needs sharpening, so if it doesn't fit you pay for sharpening only once.

To make the table frame for the jig, I used clear kiln-dried fir: 2x8s yield three pieces about $2\frac{1}{4}$ in. wide. I mortised and tenoned all frame members, which measure $1\frac{1}{2}$ in. by $2\frac{1}{4}$ in. in cross section. I mounted the working parts of the jig on an oak member for stiffness and dimensional stability, then tenoned the member into the table rails. The four press screws that hold the work against the stock have custom-made handles so I could locate the nuts on $2\frac{1}{2}$ -in. centers without the handles interfering. Wetzler Clamp Co., 43-13 11th St., Long Island City, N.Y. 11101 made mine for \$7.50 each. □

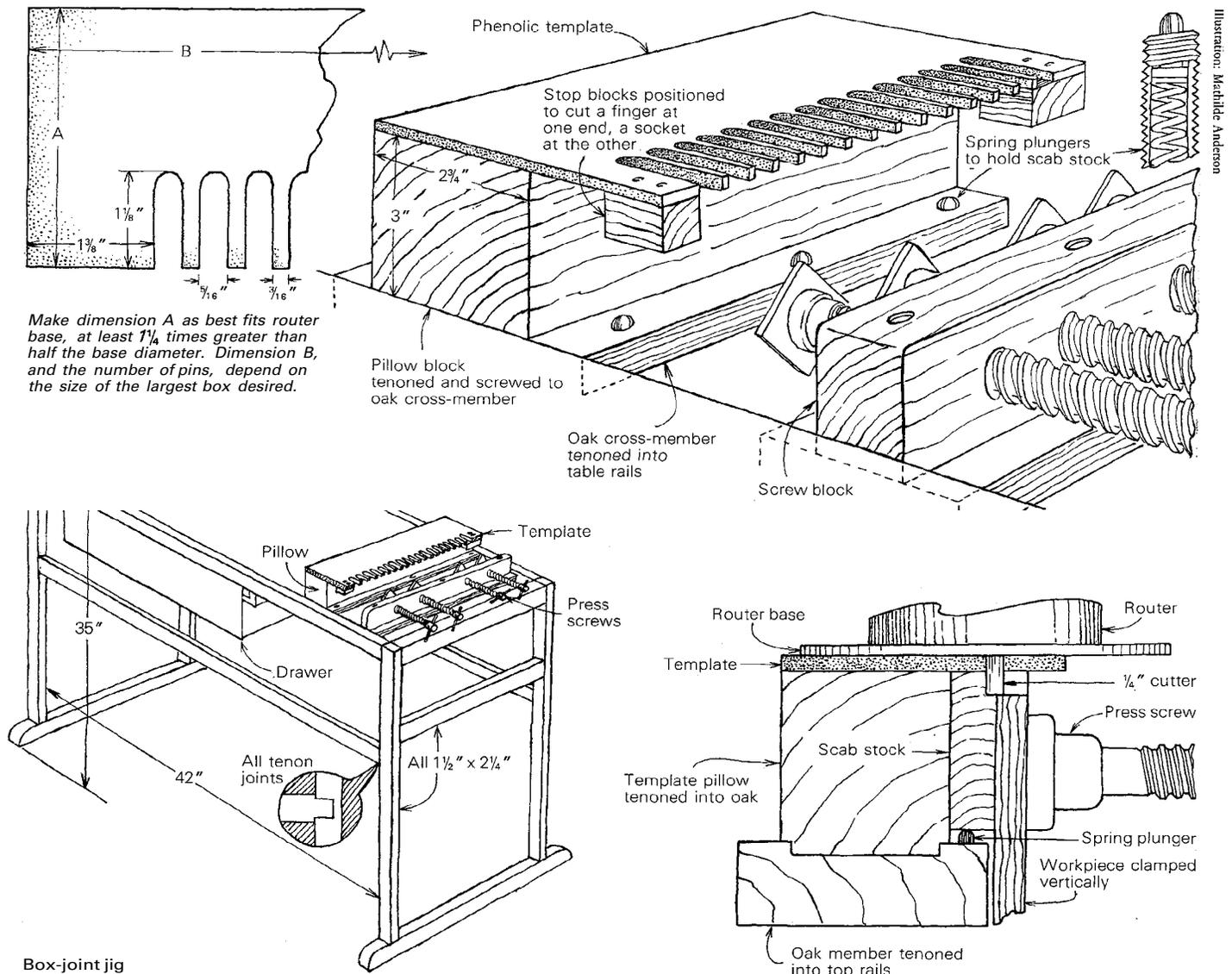


Illustration: Machide Anderson

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